Environmental Restoration

Gnome

. . .an Offsites Project

Background

During the Cold War, nuclear testing activities were conducted at sites in five states. One of these sites is located in a remote area of southeastern New Mexico, approximately 25 miles southeast of the town of Carlsbad. This site was the location of one nuclear test, designated Gnome, detonated in the early 1960s.

Restoration efforts at these "Offsites" are the responsibility of the U.S. Department of Energy (DOE) Nevada Site Office. Today, Nevada Site Office scientists continue restoration efforts with the primary goal of restoring the site's surface to allow for unrestricted access and use, and to establish long-term surveillance and monitoring.

The Gnome site is part of the Nevada Site Office Environmental Management Offsites Project, which encompasses various sites in several states where underground nuclear tests and experiments were performed outside of the Nevada Test Site. Locations include Alaska, Colorado, Mississippi, Nevada, and New Mexico. Under the Offsites Project, the Nevada Site Office is responsible for addressing possible contamination associated with nuclear testing activities and carrying out appropriate corrective actions.

History

The U.S. Atomic Energy Commission (predecessor agency to the DOE) conducted the Gnome test on December 10, 1961. A three-kiloton device, Gnome was detonated at approximately 1,200 feet below the earth's surface. The site was selected because of its geology, consisting of a bedded salt formation. A second test, designated Coach, was planned for the site but was never carried out, though preparatory drilling activities were performed.

Gnome was the first of 27 nuclear tests conducted under the Plowshare program. The Plowshare program's objective was to determine how energy generated from nuclear explosions could be used for scientific, industrial, or civilian purposes. Potential uses included: providing information on development and improvement of explosives, creating underground zones of fractured oil shale, stimulating natural gas production, and rapid excavation for large-scale construction projects such as harbors, canals, or mountain passes.

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Gnome was designed to determine the seismic signals, effects, and products of a nuclear detonation in a bedded salt medium. Although Gnome was a Plowshare test, it also provided information for the Vela Uniform program. The Vela Uniform program studied seismic detection, identification, and location of nuclear explosions. The Vela Uniform objective of Gnome was to determine how the signals and effects of a three-kiloton test in a salt bed contrasted with those of different yields in other geologic formations. There were 48 subsurface experiments involved in Gnome, making it the most heavily instrumented seismic test in history.

Restoration Efforts

The Atomic Energy Commission conducted an initial site cleanup to decommission, or close down, the site in 1968 and 1969. Activities included removing structures, burying radioactive waste within the test cavity, and plugging groundwater monitoring wells. A second decommissioning was conducted from 1977 through 1979 to address contaminated debris that became exposed through weathering.

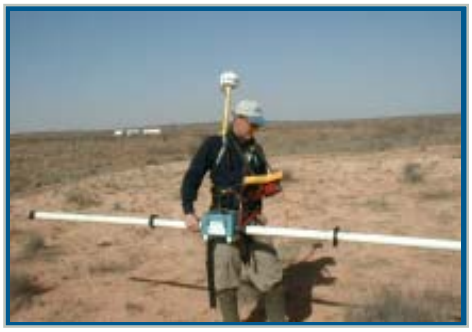
From 1993 to 1995 DOE scientists conducted various surveys to investigate surface conditions of the site, including a cultural resources survey, a floodplains and wetlands survey, and a sensitive species survey.

Scientists have completed surface characterization of the Gnome site. Activities included performing radiological surveys, collecting soil and vegetation samples for analysis, and conducting geophysical surveys to determine what level of contamination may be present in the surface and shallow sub-surface soils as well as the extent of contamination. This information is being used to verify the data collected during previous restoration activities and to identify and evaluate if any corrective actions are needed to ensure the protection of human health and the surrounding environment. Characterization work was completed in 2002.

Path Forward

The Nevada Site Office is implementing a strategy to better understand the subsurface of the Gnome site, including characterizing groundwater flow, determining the area of contamination, assessing risk to human health, and modeling contaminant movement away from the test cavity.

Subsurface site information will be evaluated to establish the subsurface conditions at the site. Based on this evaluation, the Nevada Site Office will determine the technical need to install subsurface wells and conduct additional testing to fill potential data gaps.



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